

H. B. & J. A. SAUERMAN.

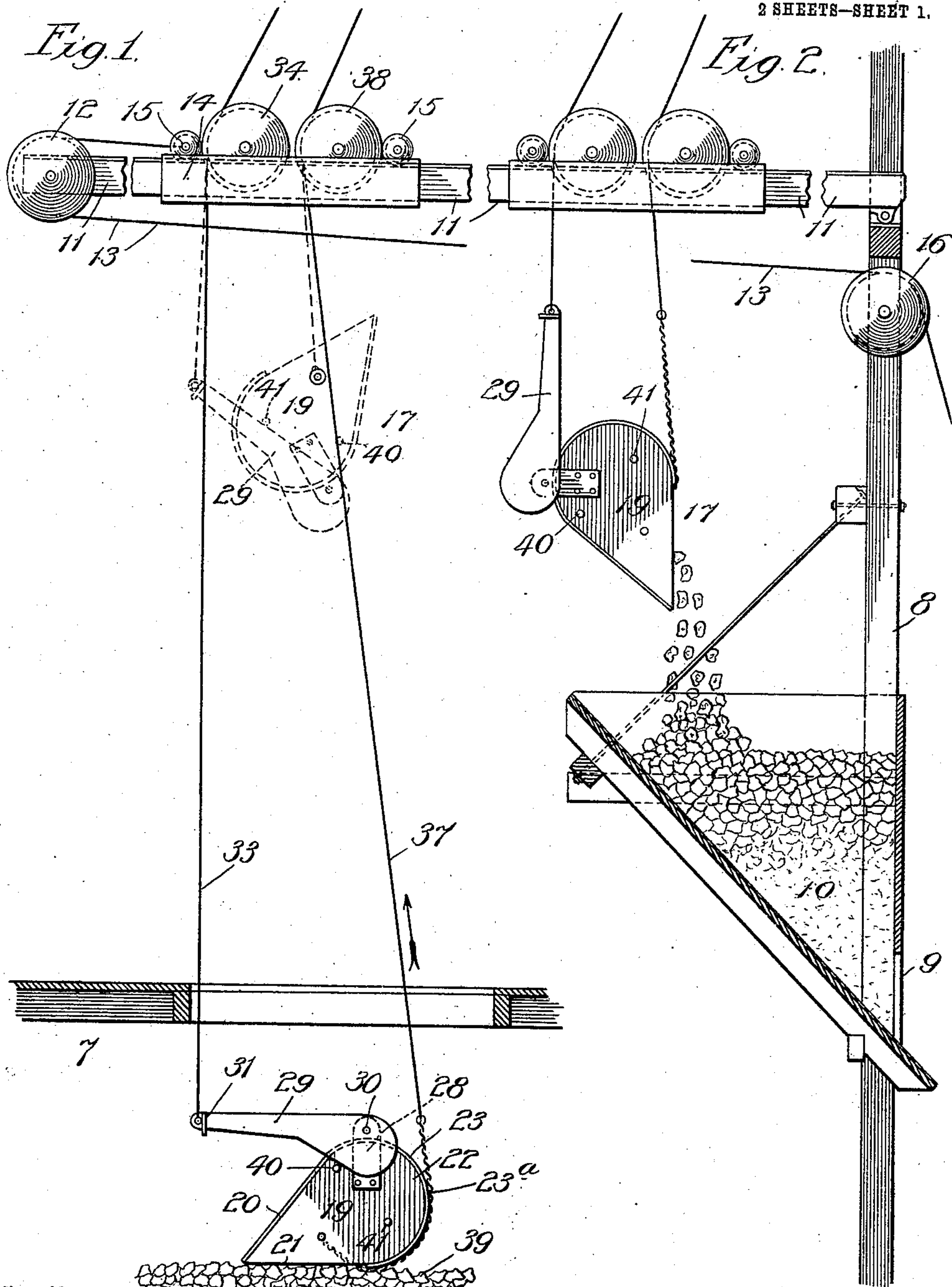
SCOOP.

APPLICATION FILED MAR. 28, 1908.

915,486.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.



Witnesses:

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Inventors:

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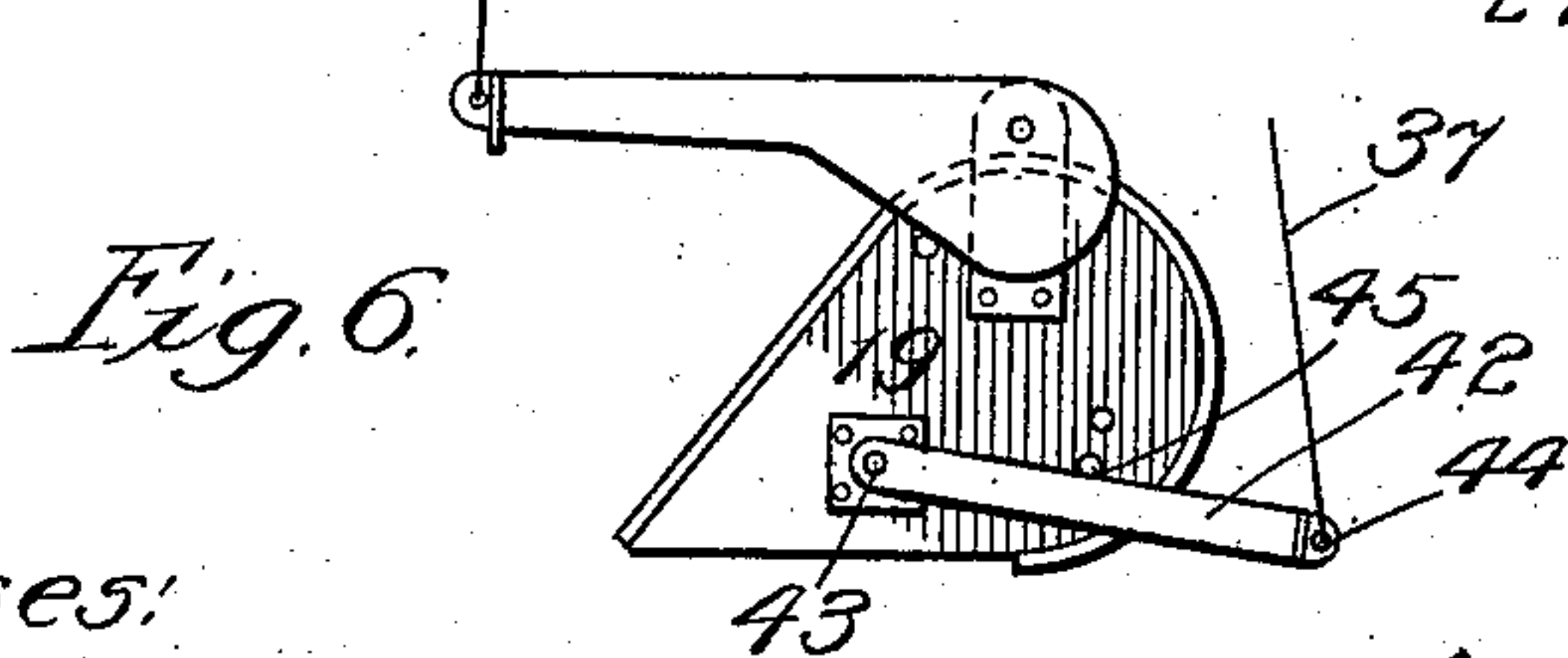
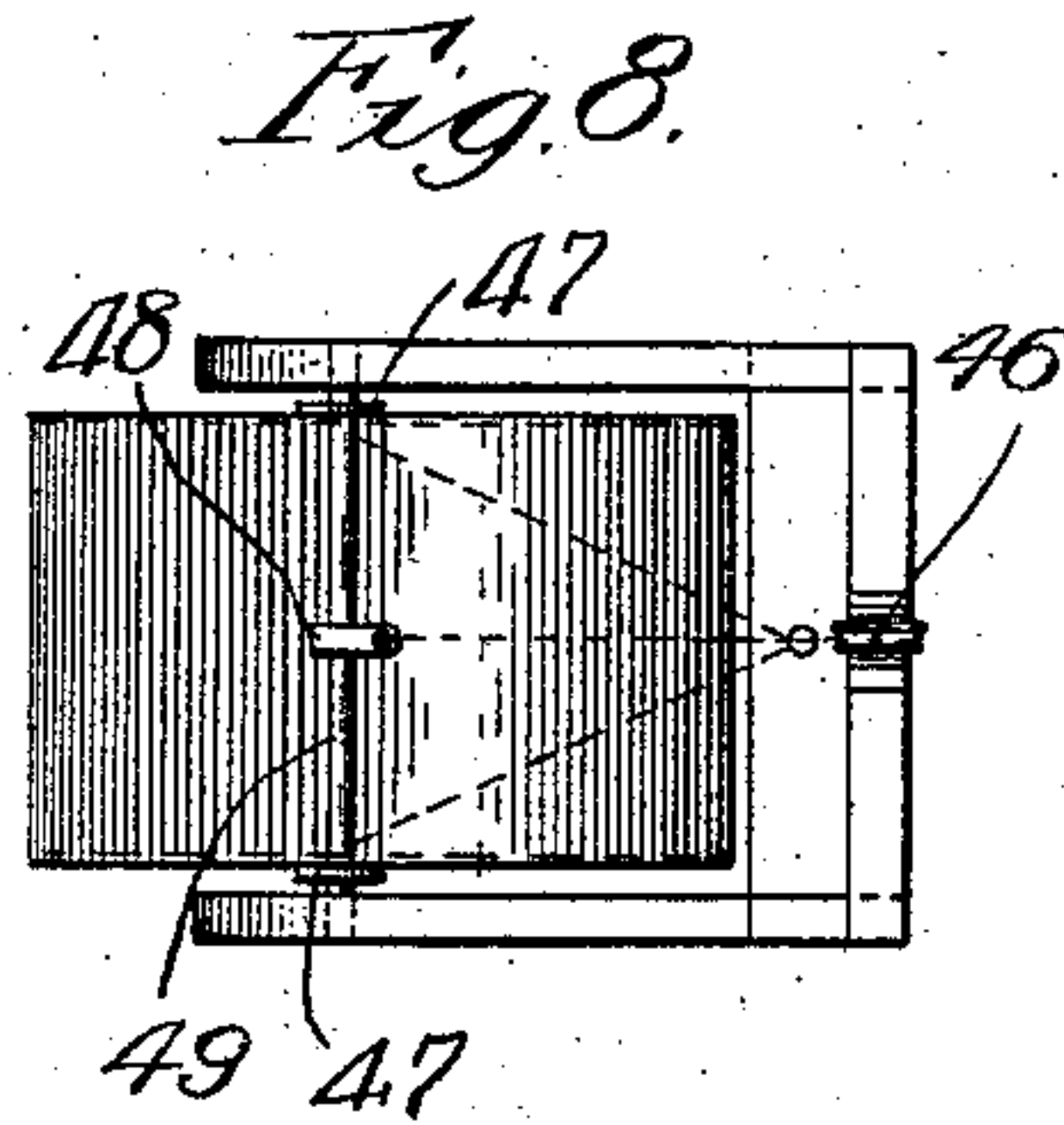
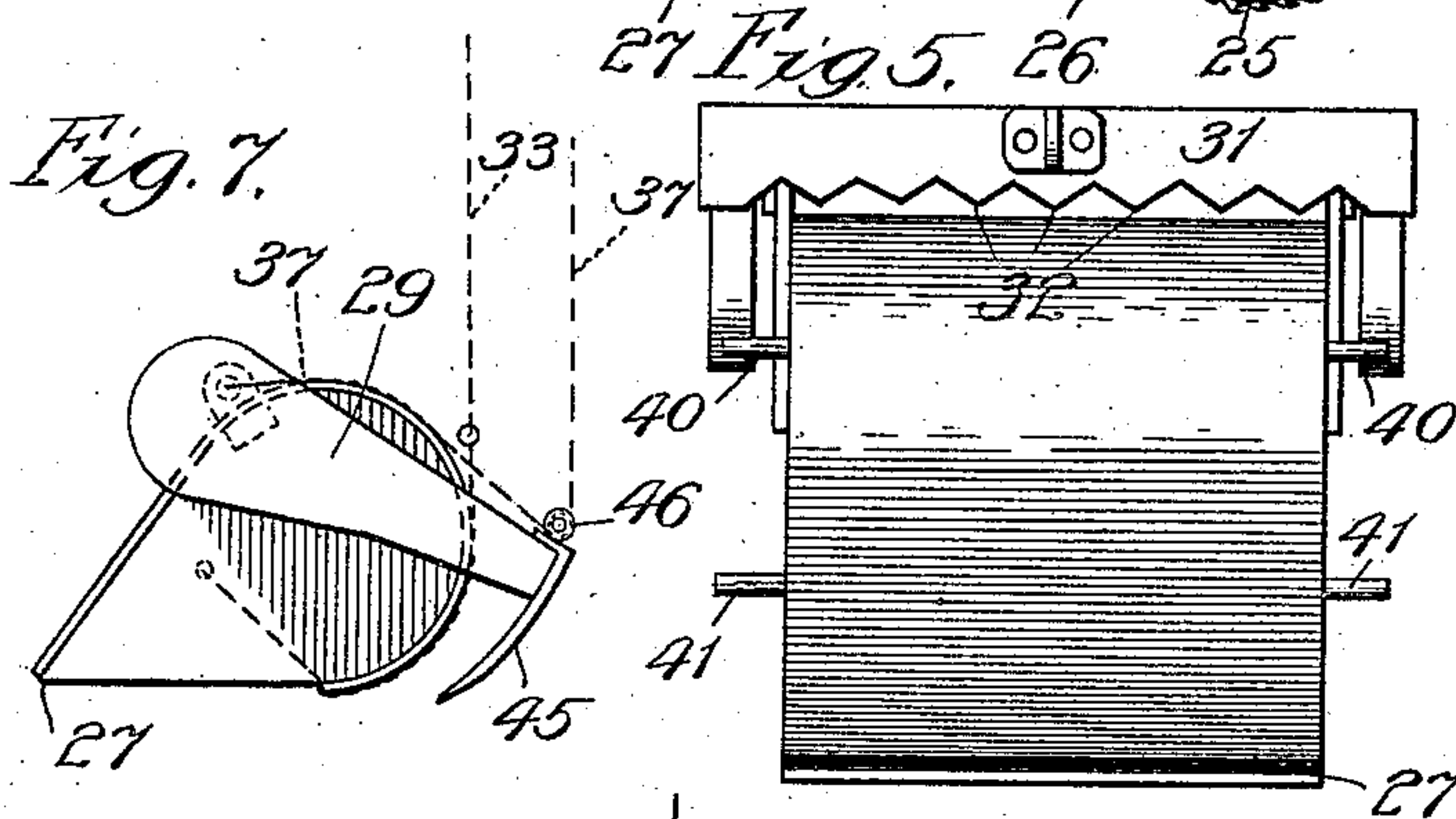
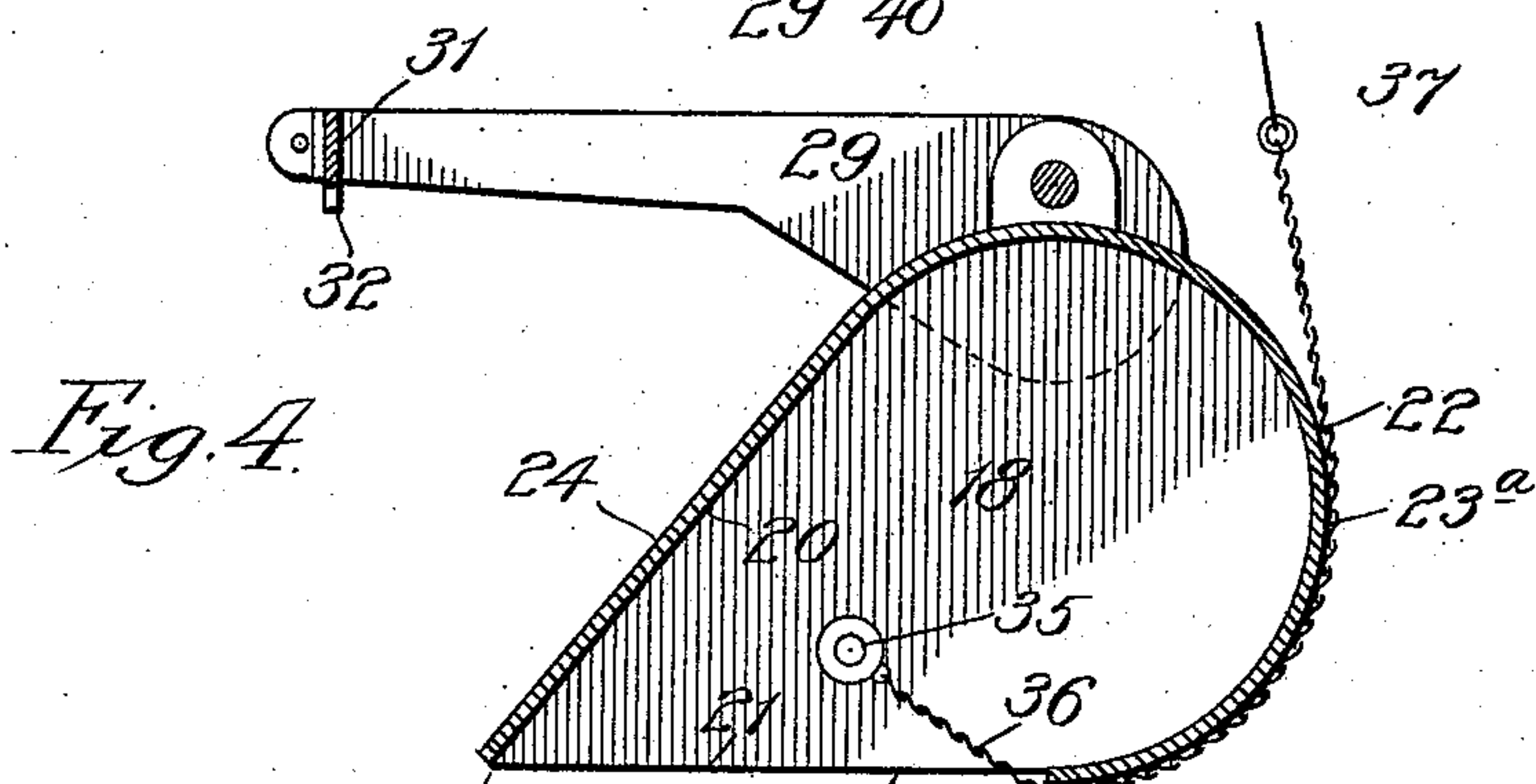
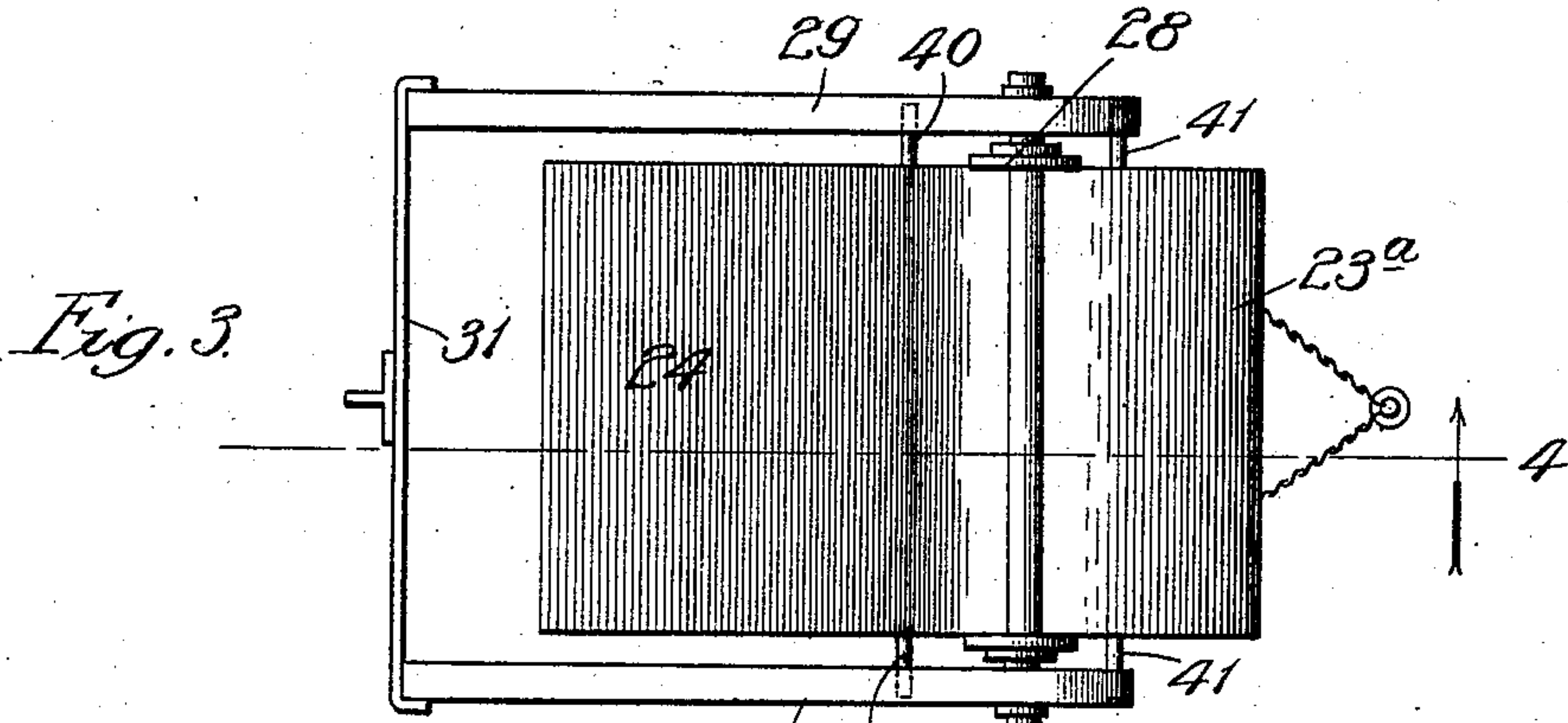
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SCOOP.

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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

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SCOOP.

No. 915,486.

Specification of Letters Patent.

Patented March 16, 1909.

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To all whom it may concern:

Be it known that we, HENRY B. SAUERMAN and JOHN A. SAUERMAN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Scoops, of which the following is a specification.

Our invention relates, more particularly to the variety of scoops intended for use in elevating ashes, coal, crushed stone, gravel, sand or other materials, from one place to another, as for instance from a dump-pile to the receiving chute of a storage bin; or for transferring it from one place to another along a horizontal or substantially horizontal plane.

Our primary object is to provide a simple construction of scoop-device involving the use of comparatively few parts and such as will render the operation of the scoop both simple and positive, it being intended that our improved scoop-device afford the advantages derived from the well-known "clam-shell" type of bucket, but avoid the disadvantages of such bucket which are principally the necessary use of sheaves for drawing the bucket-sections together, complexity of construction, and the employment of two biting edges working toward each other for filling the bucket, whereby lumps of the material being operated on are often caused to become engaged between the biting edges and thus prevent closure of the bucket-sections, necessitating the premature release of the load.

Referring to the accompanying drawings—Figure 1 is a broken view in elevation of elevating apparatus shown as supporting a scoop constructed in accordance with our invention from a trolley on a boom to cause the scoop to extend through the hatch of a vessel for operating on the contents of its hold, the position that the scoop assumes preparatory to the filling operation being represented in full lines, and the position it assumes when loaded and elevated being represented in dotted lines. Fig. 2 is a view similar to that of Fig. 1 showing the scoop in the dumping position, a bin with a chute being represented in sectional elevation into which the scoop is shown to be dumping its contents. Fig. 3 is a top plan view of the scoop. Fig. 4 is a section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow. Fig. 5 is a view in front elevation of the scoop of Figs. 3 and 4. Fig. 6 is a reduced view in

side elevation of a modified form of scoop-device. Fig. 7 is a view in side elevation of another embodiment of our invention; and Fig. 8, a plan view of the same.

In the construction represented in the drawings, our improved scoop-device is shown to be employed for elevating from a vessel 7 the contents thereof to a chute leading to a storage-bin. In this construction, a wall of the storage-bin is represented at 8 and contains an opening 9 with which a chute 10 communicates for directing into the storage-bin material discharged into the chute. A boom 11 forming a trolley-guide extends from the wall 8 and carries at its outer end a pulley 12 over which a cable 13 extends. The cable is connected at one end with a trolley 14 supported at its wheels 15 on the boom, and at its other end passing over a pulley 16 journaled in the wall 8 and beyond which the cable 13 extends to a suitable power-device (not shown) for operating it to move the trolley 14.

The bucket which is represented at 17 is of general scoop-shape with each side 18 and 19 having straight converging edge-portions 20 and 21 and a rounded portion 22, between which sides the inclosing wall 23 for joining the sides together, extends. The wall 23 thus presents a rounded portion 23^a and two converging straight portions 24, 25, one of which is cut away as represented in the drawings to afford an opening 26 and a penetrating edge 27 for engaging with the material to be scooped in a manner hereinafter described. Extending beyond the sides 18 and 19 of the scoop at its rounded portion a slight distance beyond the straight portion 24, and secured to the sides of the scoop, are lugs 28 to which are pivoted the inner, preferably weighted, ends of levers 29, as indicated at 30, connected together at their outer ends by a bar 31 preferably having a serrated surface as represented at 32, the levers 29 and bar 31 forming a bail to which is connected a holding-cable 33 passing over a pulley 34 on the trolley and connected with a suitable power-device (not shown) for operating it as hereinafter explained. Lugs 35 are secured to the inner surfaces of the sides 18 and 19 opposite to the opening 26 and between the converging edge-portions of the sides, and connected with these lugs are the ends of chains 36 which are connected together at their outer ends and are fastened

to an operating cable 37 which extends upward, passing over a pulley 38 on the trolley and connecting with a suitable source of power, not shown, for raising and lowering it.

5 The normal position of the scoop is that represented in full lines in Fig. 1, in which it is shown as resting on the material represented at 39, such as coal, to be elevated to the bin. In this position, the scoop rests at its
10 open portion, or mouth, on the coal with its chains 36 extending about a portion of the curved surface 23^a of the wall 23, and its levers 29 and bar 31 extending in approximately horizontal position through the en-
15 gagement of the levers with studs 40 extending beyond the outer surfaces of the scoop-sides.

To operate the scoop to fill it, assuming the scoop to be resting on the coal as here-
20 inbefore explained, the cable 37 is drawn upward, while the holding-cable 33 is allowed to remain slack, with the result of causing the scoop to be turned in the direction indicated by the arrow in Fig. 1. Ow-
25 ing to the weight of the scoop-proper and that of the levers 29 and the position of the latter, the scoop, as it is turned in the manner described, is caused to descend into the coal, its penetrating edge 27 sinking deeper
30 and deeper into the coal as the turning operation continues. By the time the cable 37 has been raised sufficiently far to turn the scoop-proper to the inverted position represented by dotted lines in Fig. 1, the pene-
35 trating edge 27 will have descended sufficiently far into the coal 39 to fill the scoop. As the scoop turns, the outer free ends of the levers 29 descend until the serrated surface 32 engages the mass of coal, and thus before
40 the scoop has become filled causes the serrated bar to engage the surrounding coal and present a leverage for aiding the turning movement of the scoop-proper during the remainder of the filling operation. The scoop
45 continues to turn until the cable 37 extends in a straight line from the lugs 35 to the pulley 38, whereupon the scoop is raised to the desired height for dumping its contents into the chute, by drawing on the cables 37 and
50 33. The limit of the tilting movement of the scoop is controlled by the engagement of lugs 41 carried by the scoop sides and movable into engagement with the levers 29, as represented in the dotted construction of the
55 scoop in Fig. 1. The scoop may be caused to register with the chute by operating the cable 13 in a well-known manner. The dumping of the scoop-proper is produced by slacking the cable 37 and thus permitting
60 the scoop to tilt to the dumping position illustrated in Fig. 2, thereby discharging its contents into the chute 10. When the scoop is in discharging position it will be noted from an observation of Fig. 2, that
65 all of the weight of the scoop-proper is at one

side of its pivotal connections with the cable 33 through the medium of the bail, and thus to return the scoop to normal position on the mass of coal to be scooped it is necessary only that the cables 33 and 37 be lowered, 70 the cable 33 being lowered slightly faster than the other cable, whereupon the scoop will turn upon its pivotal connections with the bail and rest upon the coal in the position illustrated in Fig. 1, in which the scoop 75 is again ready to be operated for receiving another charge of coal by the operation hereinbefore described.

The use of the chains 36 while preferable, is not indispensable, it being practicable to 80 use a bail in their place as represented in Fig. 6, the arms 42 of the bail being pivoted at their inner ends to the outer surfaces of the scoop sides, as indicated at 43, and the outer ends of the arms joined together by a bar 44 and 85 fastened to the hauling-cable 37. The operation of this modified construction is the same as that of the apparatus of the preceding figures, with the exception that the leverage of inverting the bucket to fill it 90 instead of being obtained by chains as described, is effected by the engagement of the arms 42 with lugs 45 secured on the outer surface of the scoop-sides.

In the construction illustrated in Figs. 7 95 and 8, the bail to which the holding-line is attached instead of extending from its pivotal connections toward the penetrating edge 27, as in the constructions of the pre- 100 ceeding figures, extends in the opposite direction and has as a connecting medium for its arms 29 a fender 45^a which, in the operation of filling the scoop, is caused not only to afford an engaging edge for operating against the material to be scooped to increase the 105 leverage for turning the scoop, but also to insure the retention in the scoop of the scooped material at its mouth during the scooping operation. In this construction the arms 29 are so weighted as indicated at 110 that their greatest weight will extend to the left, in Fig. 7, of their pivotal connections with the scoop. The holding-line 37 instead of being fastened to the outer ends of the arms 29 extends over a pulley 46 thereon and 115 is fastened as indicated at 47 to the lugs 28 and, as indicated at 48, to a shaft 49 extending through these lugs and on which the arms 29 are fastened.

The normal position of the bucket and its 120 operating parts being that illustrated in Fig. 7, turning of the scoop to invert it in the material to be scooped by drawing on the cable causes the edge 27 to travel across the fender 45 in close proximity to its inner surface and 125 thus the scoop may be caused to be wholly filled with material. When the scoop has been raised to the desired elevation for dumping it, the holding-cable 33 while it and the cable 37 are held taut, will extend 130

about the rounded end of the scoop so that when the cable 37 is slacked the scoop will turn on its pivots to the dumping position, and the contents of the scoop will be discharged.

Our improved scoop-device permits material to be quickly loaded into it and be quickly raised and dumped. Furthermore the operation of the device is positive, as it is caused to engage at its downwardly directed penetrating edge with the material to be scooped, and thus the objections to buckets of the "clam-shell" type are obviated. A further feature of advantage is that of simplicity of parts and the absence of sheaves on the bucket, which when employed are very liable to get out of order and produce a great wear on the operating cables. It will also be noted that the scoop-device in its operation simulates in a great measure the operation of the ordinary hand scoop and thus the scoop affords great capacity.

As will be readily understood from the foregoing description, the bucket discharges from its side, and this operation being under positive control of the operator through the manipulation of the cable 37, permits him to so operate the cable 37 as to cause the material to be thrown laterally beyond the bucket quite a distance, depending upon the position the bucket is caused to assume when dumping. The automatic operation of inverting the scoop from the dumping position to its filling position is also a great advantage, as it expedites the operation of the device and permits the transferring operation to be quickly performed.

While we have illustrated and described our invention as embodied in certain particular forms of construction, we do not wish to be understood as limiting our invention to such forms as it may be embodied in other forms and still be within the spirit of our invention.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a self-filling device for scooping up and conveying loose material, the combination of a weighted scoop of deep bowl-shape having a cutter forming one edge of its opening, a movable support from which the scoop is pivotally suspended to swing between inverted and upright positions, the scoop being so supported, constructed and arranged as to cause it to automatically swing to seat itself at its opening upon the material to be transferred, and means having eccentric connection with the scoop and operated when actuated to swing the scoop to upright position and in so swinging the same to first lower and then raise the said cutter portion, as and for the purpose set forth.

2. In a self-filling device for scooping up and conveying loose material, the combination of a weighted scoop of deep bowl-shape,

having a cutter forming one edge of its opening, a flexible raising and lowering cable, or the like, from which the scoop is pivotally suspended to swing between inverted and upright positions, and a cable, or the like, having eccentric connection with the scoop and operating when drawn upon to swing the scoop on its pivot to upright position, and in so swinging the same to first lower and then raise the said cutter portion, as and for the purpose set forth.

3. In a self-filling device for scooping up and conveying loose material, the combination of a weighted scoop of deep bowl-shape having a cutter forming one edge of its opening, a flexible raising and lowering cable, or the like, from which the scoop at opposite sides of its base-portion is pivotally suspended to swing between inverted and upright positions, and a cable, or the like, having eccentric connection with the scoop and operating when drawn upon to swing the scoop on its pivot to upright position, and in so swinging the same to first lower and then raise the said cutter portion, as and for the purpose set forth.

4. In a self-filling device for scooping up loose material and conveying the same, the combination of a weighted scoop of deep bowl-shape having a cutter forming an edge of its opening, a movable support to which the scoop is pivoted to swing between inverted and upright positions, the scoop being so supported, constructed and arranged as to permit it to be seated at its opening on the material to be transferred, and scoop-turning means fastened to the scoop at one side of the axis upon which it turns and bearing against the scoop at a point or points on the other side of its axis and operating when actuated to swing the scoop on its pivot to upright position, and in so swinging the same to first lower and then raise the said cutter portion, as and for the purpose set forth.

5. In a self-filling device for scooping up and conveying loose material, the combination of a weighted scoop of deep bowl-shape having a cutter forming an edge of its opening, a movable support to which the scoop is pivotally connected to swing between inverted and upright positions, the scoop being so supported, constructed and arranged as to cause it to normally rest at its tapering open side upon the material to be scooped and thus cause its opposed tapering side to extend in inclined relation to the surface of the material to be scooped, and means having eccentric connection with the scoop and operated when actuated to swing the scoop to upright position and in so swinging the same to first lower and then raise the said cutter portion, as and for the purpose set forth.

6. In a device for scooping up and conveying loose material, the combination of a sup-

port, a scoop pivotally connected with the support and containing an opening and a cutting edge adjacent thereto near one end of the scoop at which opening the scoop is adapted to rest normally against the material to be scooped, and scoop-turning means operatively engaging the scoop near its opposite end, as and for the purpose set forth.

7. In a self-filling device for scooping up and conveying loose material, the combination of a weighted scoop of deep bowl-shape having a cutter forming an edge of its opening, a movable support to which the scoop is pivoted to swing between inverted and upright positions, the scoop being so supported, constructed and arranged as to permit it to be seated at its opening on the material to be transferred, and scoop-turning means fastened to the scoop on the same side of the center of gravity as that on which said cutting-edge is provided and bearing against the scoop to cause it to be turned when said scoop-operating means is actuated and in so turning to swing the scoop to upright position and cause its cutter-portion to first lower and then rise, for the purpose set forth.

8. In a device for scooping up and conveying loose material, the combination of a support, a scoop pivotally connected with the support and containing an opening and a cutting-edge adjacent thereto near one end of the scoop at which opening the scoop is adapted to rest normally against the material to be scooped, scoop-turning means operatively engaging the scoop near its opposite end, and means connected with the scoop to exert weight upon the scoop above its cutting-edge during rotation of the scoop.

9. In combination, a scoop, means for

turning the scoop to invert it while in engagement with the material to be scooped, a bail connected with the scoop and comprising a pair of levers and a connecting member therefor provided with an edge adapted to engage with the material to be scooped, and a holding-line operatively engaging with said bail, for the purpose set forth.

10. In combination, a scoop, means for turning the scoop to invert it while in engagement with the material to be scooped, a bail comprising weighted levers pivotally connected with the scoop beyond a side thereof and a bar connecting the outer ends of the levers together, and a holding-cable operatively engaging with said bail.

11. In combination, a scoop, means for turning the scoop to invert it while in engagement with the material to be scooped comprising a cable, or the like, connected with the scoop and extending about a curved portion thereof, and a hauling-cable connected with said first-named cable.

12. In combination, a scoop, means for turning the scoop to invert it while in engagement with the material to be scooped comprising a plurality of cables or the like attached to the scoop at opposite sides and extending from the interior thereof around the rounded portion of the scoop, and a hauling-cable connected with said first-named cable.

HENRY B. SAUERMAN.
JOHN A. SAUERMAN.

In presence of—

A. U. THORIEN,
R. A. SCHAEFER.